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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/462,109    12/30/99    HIROSE

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| EXAMINER |
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IM52/0523

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| ROCHE, J |              |
| ART UNIT | PAPER NUMBER |

1771  
DATE MAILED:

05/23/01

*6*

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

|                              |                               |                               |  |
|------------------------------|-------------------------------|-------------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>09/462,109 | Applicant(s)<br>HIROSE ET AL. |  |
|                              | Examiner<br>Leanna Roche      | Art Unit<br>1771              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-17 is/are pending in the application.
- 4a) Of the above claim(s) 6-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
- 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
- 3) ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- |  |  |
|--|--|
| 15) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                   | 18) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____   |
| 16) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                          | 19) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 17) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3, 5</u> | 20) <input type="checkbox"/> Other:  |

### **DETAILED ACTION**

1. As filed, claims 1-3 and 5-17 are pending in this application. Claim 4 was cancelled at the national stage.

### ***Election/Restrictions***

2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in response to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-3 and 5, drawn to a composite reverse osmosis membrane.

Group II, claim(s) 6-17, drawn to a method of producing a composite reverse osmosis membrane.

3. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Groups II lacks the special technical feature of Group I. Specifically, Group II lacks the features of a contact angle between the polyamide skin layer surface and water that is no more than 45°, a salt rejection of at least 98%, and a permeate flow rate of at least 0.5 m<sup>3</sup>/m<sup>2</sup>·day.
4. During a telephone conversation with Jonathon Osha on April 24, 2001 a provisional election was made without traverse to prosecute the invention of Group I,

claims 1-3 and 5. Affirmation of this election must be made by applicant in replying to this Office action. Claims 6-17 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as obvious over Fibiger et al. (EP 0316525) or Tomaschke (USPN 4872984).

Both Fibiger and Tomaschke are directed to composite reverse osmosis membranes comprising a polyamide layer on a microporous support. In both cases, the salt rejection may be at least 98 percent and the water flux may be at least 0.5 m<sup>3</sup>/m<sup>2</sup>·day. In fact, the water flux of Fibiger and Tomaschke generally greater than 0.6 m<sup>3</sup>/m<sup>2</sup>·day. See Fibiger Tables 1-10 and Tomaschke Tables 2 and 4.

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Neither Fibiger nor Tomaschke identify the water contact angle between the polyamide layer surface and water. However, it is well known in the art that a water contact angle of less than 90° is associated with hydrophilicity (Myers USPN 5798078 Column 3 lines 4-9). Therefore, decreasing the water contact angle of a material increases the hydrophilicity of that material. It would have been obvious to the skilled artisan at the time the invention was made to have optimized the water contact angle of the polyamide skin layer to no more than 40°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In the present case, it would have been obvious to modify the water contact angle of the polyamide discriminatory layer, motivated by the desire to increase the hydrophilicity of the polyamide layer, and thus, to increase the flow rate of water through the membrane and improved salt rejection.

The polyamide layer of both Fibiger and Tomaschke is prepared from polyfunctional acyl halides and compounds bearing at least two primary or secondary amines. In both Fibiger and Tomaschke, the acyl halide component has an average of more than two reactive groups.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Myers (USPN 5798078) shows the relationship between water contact angles and hydrophilicity.

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**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leanna Roche whose telephone number is 703-308-6549. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on 703-308-1261. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



lmr  
May 18, 2001



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